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# Beach Fire Management Report 2005 DRAFT

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### **Overview**

This report represents information about Seattle Parks and Recreation's 2005 experience with outdoor recreational beach fires in our parks. Golden Gardens and Alki Beach account for nearly all of the wood smoke emissions generated on park land, as Parks currently allows beach fires in the provided rings in those parks.

This information represents staff observation and discussion, feedback from the public, and information sharing between Parks staff and staff from the Puget Sound Clean Air Agency, Seattle Police Department, and Seattle Fire Department.

We compare 2005 data to that of 2003, as these are the only years for which beach fire recreation data for these parks exists. The 2005 data consists of 1) actual estimates of burning that most likely occurred during that year's peak fire season April 1<sup>st</sup> through September, and 2) duplicate the 2003 data for the other times of the year. Using 2003 data for 2005 non-peak use periods (generally fall and winter) allows us to more accurately compare the impacts our summer beach fire management programs had between the two years.

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### **Executive Summary**

### **History**

In 2004, Parks staff recommended to the Board of Park Commissioners that future beach fire recreation at Golden Gardens and Alki Beaches be prohibited. This recommendation was formed in a staff report ("Impacts of Parks Beach Fires 2004") that same year. The report concluded that the frequency of illegal fires (burning outside of provided rings) and the amount of illegal fuels being burned (anything other than "clean, dry, firewood") significantly contributed to poor air quality events, and at times posed a safety hazard to park visitors.

After a public process, in which most respondents requested that beach fire recreation continue, the Park Board and Superintendent decided to allow beach fire recreation, and to enhance management and maintenance efforts to reduce illegal burning. The Park Board put Golden Gardens, where most of the illegal burning takes place, on "probation," and asked staff to submit a 2005 Beach Fire Report to them before the 2006 beach fire season.

### "Enhanced" Beach Fire Management in 2005

**Alki Beach:** Illegal burning at Alki Beach has diminished greatly over the past four years due to the annual assignment of a Parks "beach patrol" during peak use periods, active extinguishment of fires at park closing, a limited number of provided rings, improved signage, and public education.

**Golden Gardens:** Over the past four years, beach fire management at Golden Gardens has been less intensive (mostly in terms of beach patrol staffing) than at Alki Beach, while at the same time the number of provided rings has grown (from six to 12). In 2005, Parks implemented these efforts at Golden Gardens in hopes of reducing illegal burning there:

- 1. A three-person "beach patrol" was assigned to the park each evening seven days a week from June to September, and fires were actively extinguished at park closing time.
- 2. Removed two of the 12 fire rings to allow more space and staff access.
- 3. Added improved signage and rock borders to provide better definition of the beach fire area.
- 4. Contacted drivers entering the beach access road and gave them beach fire "rules" brochures.
- 5. Actively managed traffic and parking to reduce congestion and improve public safety.
- 6. Prohibited fires for one week before the summer started, to allow for beach restoration efforts.
- 7. Improved cooperation among Seattle Parks, Police, Fire, and the Puget Sound Clean Air Agency.

**Both Beaches:** Parks took these actions in 2005 to benefit both beaches:

- 1. Adopted a rule prohibiting the presence of illegal fuels in all Seattle parks.
- 2. Held beach fire open houses at each park
- 3. Enhanced staff training and coordination with other agencies

### Our 2005 Results (Compared to 2003 Data)

- 1. 60% fewer illegal fires. 88% less burning of illegal fuel (21.3 tons down from 176 tons).
- 2. 30% less volume of fuel burned in beach fires (335 tons down from 480 tons).
- 3. 30% reduction in gross emissions. 155.3 tons less illegal fuels burned (cleaner fuels used).
- 4. An enhanced user experience through cleaner and safer parks, and greater customer service during peak use times.

### **Recommendations For 2006**

Allow beach fire recreation to continue for 2006 as Parks will commit beach patrol resources for this year on par with 2005 levels. Parks will continue monitoring and public reporting in 2006, and will evaluate additional management options such as seasonal prohibition of fires during non-peak use times, piloting a fire ring reservation system (possible fee based), and adding one to three additional rings.

# **Attachment 1**

# 2005 Beach Fire Emission Inventory And Data Summary

### **Beach Fire Inventory**

Six beach fire rings at Alki Beach, and 10 at Golden Gardens (down from 12 in 2003 and 2004) were open to the general public year-round on a first-come first serve basis throughout 2005. Parks removed two rings at Golden Gardens to create more space between them, which improved access for staff and created more space for each user group. During peak use fire season, all the rings at both beaches were in use nearly every night it was not raining. Most of the summer, there were more groups in search of rings than were available.

### **Beach Fire Inventory**

Park	Legal Fires	Illegal Fires	Total
Golden Gardens	2,396	1,008	3,404
Alki Beach	1,316	104	1,420
Both Beaches	3,712	1,112	4,824
Difference from			
2003 levels	-364*	-1,690	-2,054

<sup>\*</sup>Due entirely to the removal of two fire rings in 2005

Through increased contact our staff had with park visitors to education them to legal fire size which is set by state law, and the public's voluntary compliance with these laws, the average legal beach fire in 2005 was about 15% small than those typically occurring in 2003.

### **Average Beach Fire Size (in pounds of fuel)**

Park	Legal Fires	Illegal Fires
2003	184	62
2005	156.4	49.6
Difference from 2003 levels	15% smaller	20% smaller

In 2005, smaller average fire size and the reduction in the number of fires occurring on both beaches resulted in the burning of 145.1 fewer tons of fuel. This is a 30% reduction over 2003 fuel levels.

**Total Fuels Burned Annually (in tons)** 

Park	In Legal Fires	In Illegal Fires	Total
Golden Gardens	187	25	212
Alki Beach	103	2.6	105.6
Misc	18	0	18
Total	308	27.6	335
Difference from			
2003 levels	-84	-58	-145.1 (-30%)

### **Emissions**

Parks focuses on three types of emissions when managing the impacts of beach fires:

- 1. The various emissions that may come from the burning of illegal fuels.
- 2. Particulate Matter at 10 micrograms per cubic meter and less (PM10).
- 3. Volatile Organic Compounds (VOCs).

"Beach patrol" and other management efforts in 2005 resulted in the elimination of 155.3 tons of illegal fuel burning at our beaches (an 88% reduction).

**Illegal Fuel Use (in tons)** 

Park	In Legal Fires	In Illegal Fires	Total
Golden Gardens	14	2.5	16.5
Alki Beach	2.5	2.3	4.8
Both Beaches	16.5	4.8	21.3
Difference from 2003 levels	-103.5	-51.5	-155.3 (-88%)

In addition, the 30% reduction in the overall amount of fuels burned on our beaches in 2005 resulted in 30% less emissions of PM10 and VOCs.

### **Beach Fire Emissions Inventory**

Park	PM10 (tons)	VOCs (tons)	From Illegal Fuels
Golden Gardens	3.5	24.3	16.5
Alki Beach	1.8	12.1	4.8
Misc	.3	2	0
Total	5.6	38.4	21.3
2003 Emissions	8	54.8	-176.6
Change from 2003	- %30	- %30	- %88

### **Attachment 2**

### **GOLDEN GARDENS PARK**

## 2005 Beach Fire Data Summary, and Program Report

### 2005 Management Plan Summary

During the summer of 2005, Parks reassigned staff resources in the North Seattle and Central East Seattle park districts to provide "beach patrol" staffing in Golden Gardens in the afternoon and evening hours from June 14 through September. On average, three staff people were assigned to Golden Gardens park seven days per week from 3 to 11 p.m. during this time, which is generally considered a "peak use" period for the park. In prior years, beach patrol staffing was assigned to the park but at the most this assignment was limited to one person serving intermittently, depending on the needs of other nearby parks. The daily responsibilities of 2005 "beach patrol" staff included:

- 1. Performing routine maintenance in the park, including litter pick-up, emptying garbage cans, and cleaning and stocking restrooms.
- 2. Posting beach fire rules and regulations signage near fire rings, beach walkway, and on the beach access road, and distributing Beach Fire Rules and Responsibility brochures to park visitors.
- 3. Contacting beach fire ring users and others to educate them on our park rules and outdoor burning regulations.
- 4. Removing illegal fire debris from the beach as well as abandoned fuels (legal and illegal).
- 5. Extinguishing fires as needed throughout the night and at park closing time.
- 6. Contact drivers entering the park on the beach access road and hand them a Beach Fire Rules and Responsibilities brochure, manage parking.
- 7. Respond to citizen requests and provide customer service.

In addition, Parks reconfigured park amenities by:

- 1. Removing two fire rings at the beginning of peak use fire season (a reduction from 12 rings to 10).
- 2. Reconfigured remaining rings to allow greater staff access and enhance the user experience.
- 3. Installed rock borders around the area in which beach fires are allowed.
- 4. Trimmed trees in the park to allow more light in public areas.

In May, Parks held a pre-beach fire season retreat with all Alki Beach and Golden Gardens Beach Patrol staff and staff from the PSCAA to train and educate Parks staff on our summer management programs at both beaches and the laws and regulations and Parks Rules that govern recreational fires on our lands, and to define the roles and responsibilities of the "beach patrol."

Parks held a Beach Fire Community Open House May 31<sup>st</sup> to publicly review our pilot approach to providing better management of beach fire recreation at Golden Gardens, and to answer questions regarding two newly adopted park rules. One rule prohibited any illegal fuels from entering any Seattle park, and the other gave staff working in Golden Gardens the ability to direct traffic to reduce congestion and improve public safety. Following the Open House, Parks staff and volunteers performed intensive beach restoration work for a week; no beach fires were allowed during this time.

### Our 2005 Results

Beach patrol staff worked closely with Fire, Police, and PSCAA to improve park conditions and better manage the public's use of the beach for recreational burning. Increased patrols from Police and Fire helped our beach fire and park management efforts in 2005. From an environmental stewardship and compliance point of view. compared to 2003 levels, Beach Patrol and our partners at Police and Fire were successful in:

- 1. Reducing the number of illegal fires by 63% (1,378 fewer fires than 2003).
- 2. Reducing the burning of illegal fuels by 90% (from 165.7 tons in 2003 to 16.5 tons).
- 3. Reducing the total size of the average legal fire by 15%.
- 4. Reducing the total amount of fuels burned from 327.9 tons in 2003, to 212.4 tons in 2005, a 35% reduction.
- 5. Enhancing the user experience by providing a cleaner and safer park and providing more customer service during peak use periods.

Overall, these efforts resulted in two tons less Particulate Matter (PM10) being generated in the park and 13.2 tons less Volatile Organic Compounds (VOCs) being generated there, 35% reduction.

With the help of increased Police and Fire patrols in the park, our beach patrol staff at Golden Gardens improved public safety and enjoyment of the park. Better traffic and parking management reduced congestion and parking problems while the reduction in illegal fires (those burned outside of our provided rings) meant less debris and litter were left behind in beach sand. The presence of staff encouraged park users to deposit trash in the trash cans which could then be emptied promptly. Through staff observations and the collection of 85 customer service surveys, it appears that Beach Patrol staffing in 2005 improved the park's overall environment and feeling of safety. More families with young children were enjoying the beach during afternoon and even late evening hours. Staff observed fewer large groups of young adults engaged in illegal behavior, including alcohol violations and fighting.

Beach Fire Recreation Inventory at Golden Gardens Beach 2005 (10 rings provided in 2005, 12 in 2003)

Fires	2003	2005	Change
<b>Summer</b> (4/1-10/1)			
Legal	2,548	2,184	- 364*
Illegal	2,184	806	- 1,378 (-63%)
Total	4,732	2990	- 1,742
<b>Total Fuels (tons)</b>	302.1	190.7	- 111.4 (-37%)**
Annually			
Legal	2,760	2,396	- 364
Illegal	2,386	1,008	- 1378
Total	5,146	3,404	- 1742
<b>Total Fuels (tons)</b>	327.9	212.4	-115.5 (-35%)

<sup>\*</sup>Due to the removal of two rings in 2005

<sup>\*\*</sup>Due to our beach patrol public education efforts, which improved voluntary compliance with state laws governing recreational fires. This resulted in 15% smaller fires (on average) in our parks. Likewise, our beach patrol presence resulted in fewer illegal fires, and when they did occur they averaged about 20% smaller than in previous years.

### **Illegal Fuels Burned**

In 2005, beach patrol staff at Golden Gardens greatly expanded staff interaction with beach users, educating them on what is a legal vs. an illegal fuel. Every day, staff posted signs at most of the fire rings, and larger ones along the beach walkway and at the park entrance. These signs illustrate and spell out what materials are legal and illegal to burn. They also personally contacted all beach ring users and others as they approached the beach, if they saw illegal fuels. In 2005, Parks adopted a rule prohibiting illegal fuels from entering any city park. Staff informed visitors of the rule if they saw a violation. Overwhelmingly, visitors complied with the rule once aware of it.

Illegal Fuels at Golden	Gardens	Beach in	the Summer	(4/1-10/1)

Illegal Fuels Burned	2003 (tons)	2005 (tons)	Difference (tons)
In Legal Fires	105.4	12.8	- 92.6
In Illegal Fires	47.4	2.5	- 45.4
Total	152.8	14.8	- 138 (- 90%)

### **Illegal Fuels Removed From Beach by Staff**

When staff contacted beach users in possession of illegal fuels, they would ask that they dispose of them in a trash can, remove the fuels from the park, or return them to their vehicle. If staff observed vehicles entering the park with large loads of illegal fuels, operators would be instructed to leave those fuels in the vehicle while in the park, or to dispose of them at the park entrance. Users generally reported they did not know their fuels were illegal.

In June, the first month of Beach Patrol, staff reported collecting up to 400 pounds of illegal fuels from users every night. In July, they reported about half as many users possessing illegal fuels, and collected only about 200 pounds each night. In August they collected even smaller amounts of fuel, about 100 pounds each night. In late August and September, there were nights times when they had to remove large amounts of illegal fuels from the beach or from vehicles.

Illegal Fuels Removed From Users at Golden Gardens Beach

Item	2003	2005	Notes
<b>Summer</b> (4/1-10/1)	N/A	8 tons	Avg 1000lbs/wk

### **Beach Fire Emissions**

Parks focuses on three types of emissions when managing the impacts of beach fires:

- 1. The various emissions that may come from the burning of illegal fuels.
- 2. Particulate Matter at 10 micrograms per cubic meter and less (PM10).
- 3. Volatile Organic Compounds (VOCs).

2005 beach patrol staff at Golden Gardens, and other management efforts that year, resulted in 138 fewer tons of illegal fuel burning in the park. The 35% (115.5 tons) reduction in the overall amount of fuels burned on Golden Gardens beach in 2005 resulted in 35-36% less emissions of PM10 and VOCs.

### **Annual Beach Fire Emissions (in tons)**

Type of Emission	2003	2005	Difference
Illegal Fuels	152.8	15.3	- 137.5 (-90%)
Particulate Matter (PM10)	5.5	3.5	- 2 (-36%)
Volatile Organic Compounds	37.5	24.3	- 13.2 (-35%)

### **Summary Recommendations**

Allow beach fire recreation to continue at Golden Gardens throughout 2006, provided Parks can commit resources on par with 2005, and voluntary compliance with burning rules and regulations continues to improve. Continue monitoring and public reporting. It has been our experience that once a culture change in code compliance has occurred, staff resources during peak use times can be drawn down somewhat.

Although fires should be allowed to continue in 2006, Parks and other agency staff should continue to evaluate additional management options, such as seasonal prohibition of beach fires during non-peak use times or piloting a beach fire ring reservation system in 2007. An uncommon (but increasingly familiar) emerging issue at the beach is that of people lighting recreational fires in portable grills or store-bought fire rings. As long as the fuel is legal, the fuel pile is within the container and of a legal size, and the fire is being tended to in a way that protects public safety and property, staff have been allowing this practice to continue. Although there have been no significant impacts or challenges resulting from it, Parks will monitor the practice in case it presents problems we need to manage in the future.

# **Attachment 3**

### **ALKI BEACH**

# 2005 Beach Fire Emission Inventory, Data Summary, and Program Report

### **2005 Management Plan Summary**

For the fourth consecutive summer, Parks assigned beach patrol staffing to Alki Beach during peak fire season. An average of two staff people monitored beach fires between 3 and 11 p.m. at least five days per week. Their presence on the beach was intermittent during that time, as the number of rings and the growing culture of compliance there allows them to swing to nearby parks for one to three hours at a time. About half of each person's eight hour shift was spent on Alki Beach exception for on holidays or special occasions when they would spend nearly 100% of their time in the park, most of it on the beach. The daily responsibilities of the 2005 beach patrol staff include:

- 1. Performing routine maintenance in the park, including litter pick-up, emptying garbage cans, and cleaning and stocking restrooms.
- 2. Deploying beach fire rules and regulations signage near fire rings, beach walkway, and on the beach access road.
- 3. Contacting beach fire ring users and others to educate them on our park rules and other outdoor burning regulations, distributing Beach Fire Rules and Responsibility brochures.
- 4. Removing illegal fire debris and abandoned fuels, both legal and illegal, from the beach.
- 5. Extinguishing fires as needed throughout the night and at park closing time.
- 6. Responding to citizen requests and providing customer service.

Overall, these efforts resulted in .4 tons less Particulate Matter (PM10) being generated in the park and 3.2 tons less Volatile Organic Compounds (VOCs) being generated there.

Although parking areas were not actively managed as they were at Golden Gardens (there is only street parking available at Alki Beach Park), staff did contact users who were seen carrying firewood from the on-street parking area to the beach.

In May, Parks held a pre-beach fire season retreat with all Alki Beach and Golden Gardens beach patrol staff and staff from the PSCAA to train and educate Parks staff on our summer management programs at both beaches and the laws and regulations and park rules that govern recreational fires on our lands, and to define roles and responsibilities of the Beach Patrol.

Before peak beach fire season began in early June, Parks staff and staff from Police, Fire, and the PSCAA held an Open House at Alki Beach to unveil our approach to managing beach fires in the coming months and answer questions from the beach fire community. Parks advertised the meeting extensively, but it only attracted a dozen or so members of the public.

### Our 2005 Results

From an environmental stewardship and compliance point of view (compared to 2003 levels), the beach patrol staff and our partners at Police and Fire were successful in:

- 1. Reducing illegal fires on the beach by 75% (from 416 in 2003 to 104 in 2005).
- 2. Reducing the burning of illegal fuels by 54% (from 10.2 tons in 2003 to 4.7 tons in 2005).
- 3. Reducing the total size of the average legal fire by 15%.
- 4. Reducing the total amount of fuels burned from 128 tons in 2003, to 100 tons in 2005, a 28 ton reduction, or 22%.
- 5. Enhancing the user experience by providing a cleaner and safer park, and providing more customer service during peak use periods.
- 6. Reducing citizen complaints (to Parks staff) of excess smoke or illegal burning from a frequency of 2-3 per week during peak season in 2002, to few or none in peak season 2005.

Beach patrol staff at Alki Beach continued to improve public safety and enjoyment of the park. The reduction of illegal fires meant less debris was left behind in the beach sand. The presence of staff encouraged park users to deposit trash in the trash cans which could then be emptied promptly.

In 2005, the total staff hours committed to beach patrol efforts have decreased as the beach user community has become better informed about beach fire rules and regulations and has come to expect a uniformed Parks presence (and Police and Fire to a lesser extent) on the beach during peak use times. Over the past four years when beach patrol staff have been assigned to the beach during summer months, the cleanliness of the beach sand and appearance of the park has improved.

### **Beach Fire Recreation Inventory**

In all, Parks provided six fire rings on a first-come first-serve basis throughout the year. As in years past, these six rings were used to capacity in the summer evenings unless it was raining.

### Beach Fire Recreation Inventory at Alki Beach 2005

(6 rings provided)

Fires	2003	2005	Difference
Summer			
(4/1-10/1)			
Legal	1248	1248	- 0
Illegal	416	104	- 312 (-75%)
Total	1664	1352	- 312
Total Fuels			- 28 tons*
Burned (tons)	128	100	(- 22%)*
Annually			
(10/1-10/1)			
Legal	1316	1316	- 0
Illegal	416	104	- 312
Total Fires	1732	1420	- 312

<sup>\*</sup>The major contributor to fewer fuels burned in 2005 over 2003 levels is an average reduction in fire size of about 15%, which is a result of the improved compliance with outdoor burning laws.

### **Illegal Fuels Burned**

Beach patrol staff continue to expand their interaction with beach users and the community to educate them on what they can legally burn in the fire rings. During the summer months, they post signs at each fire ring and larger ones along the beach walkway daily. These signs show and state what legal and illegal fuels are. They also talk to fire ring users at the rings, on the beach, and as they approach the beach if they see illegal fuels. In 2005, before peak beach fire season, Parks adopted a rule prohibiting illegal fuels from entering city parks.

Illegal Fuels on Alki Beach

Illegal Fuels	2003	2005	Difference
Summer			4/1-10/1
In Legal Fires (tons)	5.7	2.4	- 3.3
In Illegal Fires (tons)	4.5	2.3	-2.2
Total	10.2	4.7	-5.7 (- 54%)

### **Illegal Fuels Removed From Beach by Staff**

When staff contacted beach users in possession of illegal fuels, they asked the user to remove them from the park or give them to our staff to dispose of. Users generally reported they did not know the fuel they possessed was illegal. In June, staff reported collecting up to 100 pounds of illegal fuels from users nightly (1,500pounds/month). In July, they reported users possessing illegal fuels at about half the frequency and quantity of June (880 pounds/month). In August they collected only small amounts of fuel, and only once or twice a week (210lbs/month). In September, there were instances when the need to contact users and remove illegal fuels from the beach were similar to July levels (880 pounds/month).

Illegal Fuels Removed From Beach at Alki - Summer

Item	2003	2005	Summer
Illegal Fuels (tons)	N/A	1.7	4/1-10/1

### **Beach Fire Emissions**

Seattle Parks focuses on three types of emissions when managing the impacts of beach fires

- 4. The various emissions that may come from the burning of illegal fuels
- 5. Particulate Matter at 10 micrograms per cubic meter and less (PM10)
- 6. Volatile Organic Compounds (VOCs).

**Beach Fire Emissions (in tons)** 

Type of Emission	2003	2005	Notes
Illegal Fuels	10.5	4.8	-5.7
Particulate Matter (PM10)	2.2	1.8	4 (-18%)
Volatile Organic Compounds	15.3	12.1	- 3.2 (-20%)

### **Summary Recommendations**

Continue to allow beach fire recreation at Alki Beach, assuming Parks can commit resources to manage them on par with 2005 levels. An uncommon, but increasingly familiar emerging issue is the practice of lighting recreational fires in portable grills or store-bought fire rings. As long as the fuel is legal, the fuel pile is within the container and of a legal size, and the fire is being tented to in a way that protects public safety and property, staff have been allowing this type of recreation to continue. Although there have been no significant impacts or challenges to allowing fires in grills or portable fire rings, Parks will monitor the practice in case it presents problems in the future that require action.

# **Definitions**

For the purposes of this report, the following definitions apply:

<b>Beach Fire Season</b>	Time of year when the fire rings receive the most use by park visitors, generally mid-April to Mid-September.
Illegal Burning	Any type of burning which violates state or local laws
Illegal Fire	One which burns outside a Seattle Parks provided beach fire ring
Illegal Fuel	Anything burning in a fire prohibited by state and local law. Examples: pallets, yard clippings, finished wood (2x4s, plywood, etc), anything with paint or glue on it, plastic, metal, etc.
Legal Fuel	Clean, dry, natural, unfinished cord wood.
Peak Use	The time of the day, year, and/or season when the park receives its heaviest amount of visitors.
PSCAA	Puget Sound Clean Air Agency, the regional air quality enforcement agency.